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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/808,884	03/25/2004	Yu Sui	2004US301	6608

7590 08/30/2005  
Sangya Jain  
Clariant Corp.  
70 Meister Avenue  
Somerville, NJ 08876

EXAMINER

BARRECA, NICOLE M

ART UNIT	PAPER NUMBER
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1756

DATE MAILED: 08/30/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 10/808,884	<b>Applicant(s)</b> SUI ET AL.	
	<b>Examiner</b> Nicole M. Barreca	<b>Art Unit</b> 1756	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 17 June 2005.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) 14-16 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-13 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>6/17/05</u> . | 6) <input type="checkbox"/> Other: _____  |

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### **DETAILED ACTION**

1. Applicant's election of Group I, claims 1-13 in the reply filed on 6/17/05 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).
2. Claims 14-16 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on 6/17/05.

### ***Claim Objections***

3. Claims 11-12 are objected to because of the following informalities: claims 11 and 12 recite "the antireflective layer". However there was not previously an antireflective layer mentioned in claim 1. Claim 12 also recites "the photoresist" without the previous mention of a photoresist in claim 1. Appropriate correction is required.

### ***Claim Rejections - 35 USC § 102***

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1-6, 9, 10, 12 and 13 are rejected under 35 U.S.C. 102(b) as being anticipated by Holmes (US 6,110,653).
6. An acid sensitive antireflective composition is provided which includes a water soluble resin and crosslinker. The radiation adsorptive component or dye, such as 9-

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anthracene or 9-AM (chromophore) may be provided as part of the resin. Selected portions of the ARC may be removed with an aqueous developer. The water soluble resin may be a hydroxystyrene copolymer or polyacrylic acid. The crosslinker may be a divinyl ether. A photoacid generator may be also included. The overlying photoresist layer and the ARC may be exposed in a single step. The photoresist and ARC layers may also be developed together in a single step. Exposure is performed in the DUV range, such as 193 nm and 248 nm. The temperature and duration of the prebaking of the ARC layer will depend on the particular types and amounts of components selected for the composition as well as other factors known to those skilled in the art. The ARC may be exposed to an acid solution or vapor. A thin ARC layer, such as 400-450 angstroms is more effectively exposed than a thicker layer. The photoresist layer is taught in example 1 as being 0.5 microns thick. See col.2, 56-col.3, 19; col.4, 53-col.5, 4; col.5, 64-col.6, 63; col.8, 41-col.9, 50; col.10 39-49 and examples.

### ***Claim Rejections - 35 USC § 103***

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 7-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Holmes.

9. Holmes is silent on the specific pKa of the acid and does not disclose that the acid has a pKa greater than 1.0. However pKa is a constant property of a given

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material and one of ordinary skill in art would have expected an acid to have a pKa greater than 1.0. Holmes does not disclose that the acid is removed at a temperature below 220 °C. However the reference does teach that the temperature and duration of the prebaking of the ARC layer will depend on the particular types and amounts of components selected for the composition as well as other factors known to those skilled in the art, establish baking temperature as a result effective variable. It would within the ordinary skill of one in the art to determine the optimal baking temperature ARC layer in the method Holmes by routine experimentation and use a temperature below 220 °C, if required, because the baking temperature of an ARC layer are a result-effective variable, as taught by Holmes and the discovery of an optimum value of a result effective variable is ordinary within the skill of the art, as taught by *In re Boesch*, (617 F.2d 272, 205 USPQ 215 (CCPA 1980)).

10. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Holmes as applied to claim 1 above, and further in view of Jung (US 6,803,172).

11. Holmes is silent on the k value and does not disclose that the k value is in the range of 0.1 to 1.0. Jung teaches that it is possible to adjust the k value of an organic antireflective coating by controlling the proportion of the primary polymer (col.4, 64-col.5, 7), thereby establish the k value as a result effective variable. It would within the ordinary skill of one in the art to determine the optimal k value ARC layer in the method Holmes by routine experimentation and have a k value in the range of 0.1 to 1.0, if required, because the k value of an ARC layer are a result-effective variable, as taught by Jung and the discovery of an optimum value of a result effective variable is ordinary

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within the skill of the art, as taught by *In re Boesch*, (617 F.2d 272, 205 USPQ 215 (CCPA 1980)).

### ***Conclusion***

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Oberlander (US 6,944,131) discloses a positive photoimageable, aqueous developable bottom working antireflective layer comprising a PAG and polymer including an absorbing chromophore unit. The composition does not include a crosslinking agent.

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nicole M. Barreca whose telephone number is 571-272-1379. The examiner can normally be reached on Monday-Thursday (9AM-7PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark F. Huff can be reached on 571-272-1385. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Nicole M Barreca

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Primary Examiner  
Art Unit 1756

8/24/05

A handwritten signature in cursive script, appearing to read "Nick Hansen".